I1-029

Regional Office

INTERNATIONAL TECHNOLOGY CORPORATION

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DWR WAREHOUSE

97 JUL 28 PM 12:32

July 25, 1997

CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
Sacramento, CA 94612-3501

Dear Evaluators:

IT Corporation is pleased to submit an inquiry proposal to conduct applied research in ecosystem restoration through phytoremediation techniques. We have extensive experience with wetland restoration and innovative technologies in remediation and we regard the Bay-Delta region as an ideal area to optimize and apply phytoremediation technologies.

CALFED funding offers an opportunity to achieve real environmental benefits by applying an innovative technique that accomplishes many of the essential long-term goals of the CALFED program. Water quality improvements by natural methods would have immediate and long-term benefits in watershed management. Application of the phytoremediation technologies would compliment ongoing wetlands construction, increase the efficiency of natural remediation and enhance habitats for special status species.

We appreciate the opportunity to submit this inquiry and we look forward to your review and comments.

Sincerely,

Gene Suemnicht
Proposal Manager

INTERNATIONAL TECHNOLOGY CORPORATION

INTERNATIONAL TECHNOLOGY CORPORATION INQUIRY PROPOSAL for BAY-DELTA APPLIED RESEARCH TO ADDRESS ECOSYSTEM RESTORATION THROUGH PHYTOREMEDIATION TECHNOLOGY

Submitted to:

CALFED Bay-Delta Program
1419 Ninth Street, Suite 1155
Sacramento, California 95814

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

July 1997

MZ/07-25-97/PRO/97-0002

IT Corporation is a wholly owned subsidiary of International Technology Corporation

Inquiry Proposal

International Technology Corporation (IT) proposes to conduct a phytoremediation study in wetland settings to identify and optimize phytoremediaiton processes in improving water quality. Phytoremediation techniques are receiving increasing emphasis as a natural rather than induced mechanical or chemical process to remove a wide variety of contaminants. Restored wetlands are ideal phytoremediation sites that can be constructed in a variety of settings to collectively benefit the overall water quality of an entire drainage area. The goal of the proposed study is to optimize natural remediation processes in constructed wetlands by selecting native plant species to remove site-specific contaminants. The specific ecological objective is to improve water quality downstream of a contaminated site or sites. Monitoring and evaluation would include geochemical analyses to monitor water quality and isotopic analyses to monitor fate and transport processes and the effectiveness of remediation.

The proposed project would be divided into the following phases:

- Background data review - a literature search and empirical data review on native wetland plants and the range of potential contaminants in delta settings.
- Feasibility studies - testing and analysis on pilot scale or limited plot experiments.
- Wetland construction - application of phytoremediaiton techniques to cleanup a contaminated area by constructing a full scale phytoremediation wetland.
- Evaluation - data analysis and demonstration of water quality improvements.
- Optimization - review and revision of site operations. Construction of additional wetlands targeted to address specific regional problems.

Scheduling would include background review and feasibility testing in years one and two, construction and ongoing testing in years two and three, and any additional optimization beyond year three. A suggested series of milestones are included your review.

The project deserves funding because it offers a unique opportunity to increase wetlands, foster less intrusive remediation techniques and improve water quality. Phytoremediation is a relatively new technique and requires additional research to tailor the processes to the Bay-Delta

environment and specific contaminants. The compilation of potential contaminants and phytoremediation techniques alone represents a significant improvement in the background knowledge for the Bay-Delta region. Improvements in geochemical techniques offer the promise of better monitoring and chemical specific tracking of natural remediation processes. Initial funding would apply to studies up to the feasibility stage but project extensions may apply the techniques and lessons to similarly impacted sites in the Bay-Delta region. IT has conducted preliminary talks with stakeholders in the Bay-Delta region and has found no lack of potential sites for applying successful techniques developed through this proposal. The principal obstacles to achieving widespread application have been the lack of standardized phytoremediaiton techniques and optimizing existing wetland construction to achieve the maximum improvement in water quality. CALFED funding would allow development of methods outside of potentially conflicting site interests achieving water quality improvement at many scales and to many stakeholders for the greatest regional benefit.

IT Corporation is a comprehensive environmental firm that provides management and engineering services to a wide range of industrial and governmental clients. Our background includes more than 70 years of hazardous waste management, water pollution control, industrial waste management, water quality, and wastewater treatment. We have successfully completed thousands of environmental projects ranging in scope from small assessments to $125 million Superfund site cleanups. IT's directly relevant project experience includes wastewater, water quality, and wetlands reconstruction projects in the Bay-Delta region. IT was the principal contractor for federally funded wetlands restoration at the Concord Naval Weapons Station in the west delta region. IT intends to coordinate and support the project through its local office in Martinez and through any additional research facilities that the company maintains. The participation of academic institutions will be supported through available campus facilities and laboratories. Any additional analytical or engineering facilities would be identified as necessary. In general, all of the investigative work and feasibility studies would be conducted within the Bay-Delta region.

SUGGESTED PHYTOREMEDIATION PROJECT MILESTONES

Project Phase and Task	Potential Start Date	Anticipated Completion Date
Year 1		
Literature search	March 2, 1998	June 1. 1998
Plant Species Studies	June 1, 1998	March 1, 1999
Eng. Design	March 2,1998	August 3, 1998
Test Plot Construction	March, 1999	June 7, 1999
Chemical Sampling Program	July 6, 1998	to completion
Review and Reporting	January 15, 2000	biannually to completion
Year 2	June 7, 1999	January 1, 2000
Year 3	Ongoing	
Year 4	Ongoing	

INTERNATIONAL TECHNOLOGY CORPORATION
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BAY-DELTA APPLIED RESEARCH
TO ADDRESS ECOSYSTEM RESTORATION
THROUGH PHYTOREMEDIATION TECHNOLOGY

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